

## Pecora 12 Pleases Planners



**Dr. Vincent Salomonson**, Director, Earth Sciences Directorate, NASA/Goddard Space Flight Center (l), presents **Dr. Ray Jackson** (r) with the 1993 William T. Pecora Award at the Pecora 12 Banquet August 25th. **Dr. Allen Watkins**, Chief, NMD/USGS (center) looks on.

After months of planning, Pecora 12 Symposium organizers couldn't be happier with the results of the recent conference. Pecora 12, held at the Sioux Falls Holiday Inn City Centre, August 24-26, followed the theme "Land Information from Space-based Systems." Organizers hoped the symposium would provide a platform to evaluate the adequacy of space-based systems in dealing with land information needs in an era of global concern. It accomplished that and more according to **Bob Haas**, Pecora 12 Committee Chairman. "Pecora 12 differed from previous Pecora symposia because of greater overall interest of academia and agencies. It also offered attendees more opportunities to respond and participate than other professional meetings."

### Keynote Address

After introductory remarks by Haas, and one of many welcomes EDC Chief **Don Lauer** would deliver during the week, **George Woodwell**, Director of the Woods Hole Research Center, Woods Hole, MA, opened the Pecora 12 Symposium by delivering a keynote address, "To Repair A World Gone Awry." Woodwell outlined four points he considers vital if humans are to repair a world gone awry:

1. In the area of environmental issues, leadership must come from the scientific and scholastic communities,

2. New and urgent issues involving our environment often pit public versus private interests against one another,
3. The scale of the influence of forests compare in magnitude with the importance of oceans in our environment,
4. Success in protecting the public interest needs to come from the scientific and scholarly communities.

While the United States leads the world in defending human rights, Woodwell maintains that the U.S. Congress has been unresponsive in providing leadership on environmental issues. He concluded his talk by telling Pecora attendees that it is their job to offer technological opportunities repeatedly and relentlessly to the public.

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## UP FRONT

A real challenge for the Center staff this past August was hosting the Twelfth William T. Pecora Memorial Remote Sensing Symposium. Over three hundred scientists, educators, students and administrators attended, including representatives from several foreign countries. Many of you served on various committees for the conference and it was largely through your efforts the conference was an outstanding success.

The technical program followed an interesting approach. Rather than reporting on projects completed, authors were encouraged to address policy issues and future needs for satellite data. Working lunches and extensive use of panel discussions led to a free exchange of ideas and perspectives. Keynote speakers challenged participants to direct future programs and view technical work from a global perspective. Many of the discussions and challenges led to lively exchanges!

Several of the technical papers and poster presentations represented the excellent work done by EDC employees. Much of the "behind the scenes" support came from you. The enthusiasm and professional conduct of EDC staff were noted by visitors on the tours of the Center. Following the conference, the Data Center organized two forums: one on the National Satellite Land Remote Sensing Data Archive and the other on Plans for Landsat 7. Again, EDC staff were critical to the success of the forums.

Dr. Vince Salomonson, head of the Earth Sciences Directorate, at the NASA/Goddard Space Flight Center, told me there would be another Pecora conference soon and that EDC was the appropriate host. When he said that, he was, I believe, speaking for most of the attendees and was acknowledging the outstanding job done by you in presenting the conference. If you agree, I recommend we consider hosting Pecora 13 in 1995 or 1996.

Donald T. Lauer

## EDC Hosts Landsat National Security Users' Conference

The EROS Data Center hosted a conference at the Howard Johnson Hotel, Sioux Falls, June 21-24 for Department of Defense agencies to review and discuss plans for future Landsat systems as well as the EDC's processing and distribution functions. [Landsat 7 is planned for 1997.]

According to the Program Development and Control Office, EDC host organization for the conference, approximately 125 people, representing roughly 40 entities within DoD, participated in the 4-day conference. "I think the

conference went very well," said **Wayne Rohde**, Assistant Center Chief for Programs and primary conference organizer. "It was an opportunity for DoD users to meet with the representatives from DoD and NASA that are in the Joint Landsat Program Office and to hear about some of the plans and to provide specific user input. They hadn't had a good opportunity to do that prior to this conference."

A DoD representative who was instrumental in helping Rohde and other EDC staff plan and host the conference was U.S. Air Force

**Major Steve Gourley** with the Pentagon's Defense Support Project Office. According to Gourley, conferences such as this allow users and developers to come together and compare notes on a variety of related topics. "We knew training was an issue," said Gourley, "but we didn't realize the extent to which it's important to these people (DoD users) and the lack of extent that it exists. We've learned that the infrastructure is not there and we need to improve that."



Maj. Steve Gourley

Rohde and Gourley believe the Landsat National Security Users' Conference helped to expose the civil sector to the importance of the Landsat program to DoD. Conversely, the conference was extremely beneficial because EDC and NASA people could be included in the briefings - exposing DoD users to the civil side.

### Perspectives

#### NASA

A key participant representing the civil sector was NASA's

**Ellen Herring**, Systems Manager with the Earth Science Mission

Operations Project at the Goddard Space Flight Center (GSFC), Greenbelt, MD.

Herring's group has responsibility for implementing the Landsat 7 ground system. [Herring, incidentally, works closely with the EDC's **Bruce Quirk**, who has been assigned as the official EDC interface with the GSFC.]



Ellen Herring

From a NASA perspective, Herring says key issues include the disconnects between the amount of data that will be captured aboard Landsat 7 and how much information can be processed through the system. Of course that involves a budget problem that needs to be

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## EDC Hosts World Data Center Directors

**T**wenty-five people, representing World Data Center-A (WDC-A) facilities in the United States, met for their annual meeting at the EROS Data Center July 22-23. World Data Centers, which originated during the International Geophysical Year (IGY) in 1955, is an amalgamation of data centers worldwide under the auspices of the International Council for Scientific Unions (ICSU). The WDC concept is a concerted effort to exchange data to serve the scientific community.

The EDC was accepted as one of 13 WDC-A's (the "-A" designation indicates their U.S. location) in 1992. The other four groups of WDC units include WDC-B, Commonwealth of Independent States (Former Soviet Union); WDC-C1, Europe; WDC-C2, Asia (Japan & India); and WDC-D, China.

According to **Bill Draeger**, Chief, Data Services Branch, being a WDC-A doesn't drastically affect the way the EDC does business. However, this designation does provide a greater opportunity for people worldwide to learn about EDC data, programs, and activities. "It also

allows us to talk to folks outside the remote sensing community, because we are about the only remote sensing world data center. The others involve astronomy, atmospheric trace gases, solid Earth geophysics and all kinds of other scientific data."

**Draeger**, the EDC's World Data Center representative, said the meeting hosted by EROS allowed attendees to discuss what each Data Center is doing, the highpoints of their year, and some of the common issues facing each center. "Everybody has problems with international exchange of data, data pricing, and trying to decide where you are in competition with the private sector. Some organizations aren't interested in sharing data. The whole thrust of the World Data Center is we want to share as much scientific data as possible. They shouldn't be priced any higher than absolutely necessary - just enough to cover the cost of reproduction and distribution. And that's our policy here, but in some countries some of the data get commercialized and users end up being charged for the "value" of the data. That prices a lot of the scientific community out of the market."

**Draeger** briefed the meeting on current activities taking place at EROS. "I talked about our 1-kilometer project where we are gathering data from all over the world, archiving them here, and our TMACS (TM/MSS

Archive Conversion System) project whereby we're taking all of the old Landsat data and putting them on a new media - essentially preserving them."

While the people who attended the WDC-A Meeting weren't necessarily interested in remote sensing or image processing, they nonetheless found EDC fascinating because of its archiving, customer service, and dissemination capabilities. "Most of the WDC-A facilities don't deal with the general public nearly as much as we do," explained **Draeger**. "We sell a lot of air photos to "John Doe," the guy on the street. Most of them (WDC-A facilities) have esoteric kinds of collections that only the scientific community cares about."

Each WDC-A meeting is held at a different member location. The July meeting was the first time such a meeting had been held at the EDC. The next WDC-A Directors' Meeting will be held in Asheville, NC. ☺



During a tour stop in the SAB's new workroom, **Jim Sturdevant** (l) introduces **Tom Loveland** (r) and his demonstration topic to some of the 25 WDC-A directors who met at EROS July 22-23.

**EROSDATA is published quarterly for EDC employees. The success of this publication depends on your input. EROSDATA coordinators welcome your comments and ideas for future issues.**

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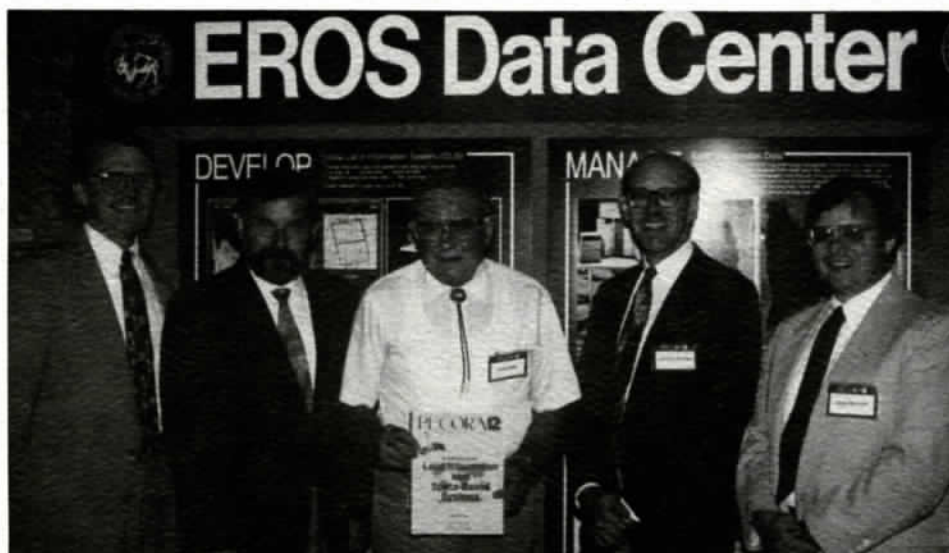
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## Participants

The Pecora 12 Program included 13 invited speakers who participated in three plenary sessions. According to Haas, these sessions spurred an in-depth transfer of information. "Scheduled panel discussions were very successful in permitting exchange among presenters and with the audience on many issues related to the development of remote sensing." Invited and volunteer papers added to the exchange of information by examining the need for land information, current capabilities for developing land information, and expected future developments. Over 90 scientists, engineers, technicians, and other professionals submitted titles and abstracts of papers and posters for information on remote sensing and other technologies for monitoring the lands of the Earth. Proposed papers were from agencies and institutions throughout the United States and a number of foreign countries.

In addition to many domestic and international professionals representing a wide range of scientific and technical disciplines, Pecora 12 also offered EDC employees an opportunity to showcase their activities. "We had five people submit papers and eight staff members submit posters," said Haas. "Incidentally, the poster session [chaired by **Jess Brown** Aug. 24, 5:30-7:30 p.m.] was a real highlight. People enjoyed it and participated." The individuals who completed posters on a variety of key EDC activities included: **Dave Zokaite** "Contrast Enhancing and Adjusting AVHRR Scenes for Solar Illumination", **Dana Larsen** and **Karla Sprenger** "A Practical Implementation for a Data Dictionary in an Environment of Diverse Data Sets", **Sue Alstad** and **Dave Jackson** "Development of a Graphical User Interface for the Global Land Information System (GLIS)", **Darla Werner** "Status of Landsat Thematic Mapper and Multispectral Scanner Archive Conversion System", **Dana Larsen**, "Twenty Years of Landsat Data Accessible Through the



*Members of the Pecora 12 Symposium Committee: (l to r) **Ray Byrnes**, Publicity/Sponsors, **Ron Beck**, Arrangements/Finances, **Bob Haas**, Chairman, **Larry Pettinger**, Publications, and **Jim Merchant**, Program.*

National Satellite Land Remote Sensing Data Archive", **Carolyn Van Beek** and **Rick Vandersnick**, "The History of Greenness Mapping at the EROS Data Center", **Mike Madigan** and **Mary Weinheimer**, "CD-ROM Technology at the EROS Data Center", **Mike Fleming**, "Relative CIR: An Image Enhancement and Visualization Technique", **Fred Waltz**, "The Proposed EROSpace Institute, a National Center to be Operated by Space Grant Universities," and **Tim Smith** and **Kathy Goodale**, "Global Land Information System (GLIS) Access to Worldwide Landsat Data."

In addition to posters and papers, many other EDC staff contributed to the overall success of the symposium. For example, **Ken Boettcher** and **Randy Sunne** guided tours throughout the conference, with back up assistance provided by **Donna Scholz** and **Charlie Trautwein**. **Glenn Kelly**, **Don Ohlen**, **Jay Feuquay**, and **Rich McKinney** provided demonstrations during stops on the guided tours. And, not to be forgotten are the countless other individuals who played critical "behind the scenes" roles. Among the many people Haas praised for making Pecora 12 run smoothly were **Jan Nelson** and **Darla Larsen**, Technical

Information. Nelson and Larsen put in 60 hours of overtime as Pecora 12 approached to complete programs, posters, abstracts, viewgraphs, and displays. Haas also recognized **Don Becker**, Technical Information, and **Gary Nelson**, Electronic Engineering for their outstanding audio/visual and multimedia support services.

## Banquet and Pecora Award

Following an hour mixer the evening of Aug. 26, **Dr. Vincent Salomonson**, Director, Earth Sciences Directorate, NASA/Goddard Space Flight Center, served as Master of Ceremonies for the Pecora 12 Banquet and Pecora Award Presentation. **Payson Stevens**, Internetwork, Inc., presented two unique, interactive, multimedia computer presentations that he produced in cooperation with the U.S. Geological Survey. "Arctic Data Interactive" was produced through the USGS Information Systems Division as a prototype of a science journal using multimedia technology. "This provides the user with the opportunity to see the results of the data, visualize them, manipulate them, and access the data for their own research."

The second project Stevens showed Pecora 12 Banquet attendees

featured satellite data that can be accessed visually - showing animation changes through time. "Geomedia," for grades 4-7, originally was produced for a kiosk at the USGS Visitor's Center. "It was pressed as a CD-ROM featuring the water cycle, understanding maps and earthquakes," explained Stevens. "It gives young people and adults the opportunity to see basic concepts in the Earth sciences."

Following Stevens' multimedia presentation, **Dr. Ray D. Jackson**, Tucson, AZ, was announced as the 1993 Pecora Award recipient. The William T. Pecora Award has been awarded since 1975 to individuals or groups for outstanding achievements and leadership in the advancement of remote sensing. Jackson was honored for his pioneering work involving the use of remote sensing to manage natural resources, agricultural lands, and monitor the environment.

### Pecora Memorial Address

**Alexander Goetz**, University of Colorado-Boulder, recipient of the 1982 Pecora Award, provided the Pecora Memorial Address. In his address, "Sensing, Spectra, and Scaling: What's in Store for Land Observations?", Goetz referred to a 1967 quote in which the late **Dr. William T. Pecora** outlined his vision for the use of remote sensing technology. Twenty-six years later, Goetz stressed that remote sensing scientists "need a modern version of Bill Pecora's vision." In conclusion, Goetz said that environmental issues in the next decade will hinge on the political will and promise of future technology.

### Concluding Address

Perhaps the most interesting and lively presentation during the Pecora 12 Symposium was provided by **Dr. John "Jack" Estes**. In his concluding address, "The Mythical Map," Estes offered his personal sentiments on the direction of the sciences of mapping and remote



**Jack Estes**

sensing. A former faculty member with the University of California-Santa Barbara, Estes is now in a dual-advocacy position with the USGS and NASA. According to Estes, "There is a problem with maps and the mapping sciences today. It's a matter of resources. It's a matter of national priorities. And it's a matter of national security."

Despite the fact that complex changes are occurring in our global system that touch all levels of society, Estes stressed that today "there remains no comprehensive, coordinated global measurement mapping, monitoring, and modelling program."

Estes continued by sharing with the audience six issues of global concern compiled from the United Nations Environment Program: These issues include:

- Of 10-to-100-million species in the world today, only 1.4 million have been catalogued,
- Twenty-four percent of the world's population consume about 75% of the energy and 80% of the minerals, paper, and chemicals, and 48-to-72% of the food,
- Every 14-15 years the Earth's population will increase by one billion people,
- Desertification is affecting some 47% of the total surface of the globe,
- Only one-tenth of one percent of fresh water is readily available [65% is used for irrigation, 25% is used for industry, and 10% is used domestically],
- About 1.5 billion people earn less than one U.S. dollar each year.

According to Estes, mapping has an old history that can help provide information to solve some of these problems. While cartographic techniques have advanced significantly since the Age of Discovery, "terra incognita" still exists. "We may know the outlines of continents. We may know the geo-political boundaries of countries. In those geo-political boundaries we don't have adequate data. If we look at the status of world cartography at scales from 1:50,000 to 1:100,000, we find large areas of

Africa, significant areas of Asia, South America, and Europe unmapped. Furthermore, we find significant areas of North America unsurveyed."

While significant areas of the world remain unmapped, Estes says other areas that have been mapped are not available for public distribution. "We just can't get a hold of these data. Yet, we're going to spend a lot of money on a global change research program when we don't have any idea of what the state of our environment is at now?"

Estes showed a map displaying the age of USGS 1:24,000-scale topographic maps covering the U.S. While 14% are one-to-10 years old, 9% are over 40 years old. The balance of our 1:24,000-scale maps are between 10 and 40 years old. This prompted Estes to ask: "Where have we been supporting the fact that mapping needs more money in the federal establishment? The USGS is doing the best job it can with the resources available and it's taking all the budgetary hits that other agencies are."

We typically have or produce maps in areas that are perceived as national military threats. Why then don't we have better maps in areas perceived to represent a scientific, economic, or environmental threat? We need more dialogue on how we move military intelligence data into the civil community. There are valid reasons why the intelligence community wants to limit data access, but such control inhibits science planners, resource managers and their ability to do the job."

Estes says the challenge is how to dissolve the myth or the fact that "data is power" so that we must stockpile our data resources. "We also have scientists who hoard data. We need to break this down because I believe the issues of environmental and economic health are very important."

If mapping is so easy, why isn't the world better mapped? We need to stop perpetuating the mapping myth. Adequate maps do not exist. Mapping is not easy and it is not

inexpensive. There is a lot of fundamental science left to do in mapping. We need to put more resources into mapping and we need to get together on it. As scientists we must not only educate policy and decision makers on the need for more and better maps, we must advocate."

Estes concluded his address by asking Pecora 12 attendees to remember: "Decisions are being made. Why do we need maps? Hopefully to make better decisions. We need a comprehensive program that deals all the way from acquisition through the data bases into the policy arena to support a better understanding of the planet we live on."

### Forum on the NSLRSDA

Once the Pecora 12 Symposium adjourned at 11:30 am Thursday, Aug. 26, the U.S. Geological Survey, in conjunction with the Pecora 12 Symposium, hosted A Forum on the National Satellite Land Remote Sensing Data Archive (NSLRSDA), from 1-4 p.m. A diverse group of five panelists provided brief introductory comments before taking questions from the audience. The panel, moderated by **Ray Williamson**, Office of Technology Assessment, Congress of the United States, included: **Kass Green**, President of Pacific Meridian Resources, **Dr. Stan Morain**, President of the University of New Mexico's Earth Data Analysis Center (EDAC), **David Edwards**, Executive V.P. of EOSAT, **Dr. Chris Johannsen**, Purdue University, and **Tom Bickerton**, World Agricultural Outlook Board. Chaired by **Tom Holm**, this Forum allowed the USGS to solicit input from users as it continues to develop plans and policies for the NSLRSDA. In addition to topics such as remote sensing data availability, management, products, use, and distribution, Forum participants also openly discussed data preservation priorities, foreign data sets, volume, cost, timeliness of data, and the role of Earth Science Information Center (ESIC) offices such as the EDC.

### Landsat 7 Forum

Complementing the Pecora 12 Symposium and the National Satellite

Land Remote Sensing Data Archive Forum, a Landsat 7 Forum was held the morning and afternoon of Friday, Aug. 27. Sponsored by the Department of Defense and NASA Joint Landsat Program Offices, the Forum provided the user community with an overview of the current status of the Landsat Program. Representatives of both the DoD and NASA were introduced by **R.J. Thompson**, Chief of the EOS Data Systems Project Office, who served as moderator. The consolidated program overview focussed on the history and scope of the Landsat Program as well as look at the emerging data policy for Landsat 7 data acquisition and product generation. Of interest to the user community were discussions involving ground data systems operations, user interface capabilities, product characteristics and plans. The Forum concluded with discussion of DoD and NASA user applications of Landsat 7 data products, a presentation about plans for an Advanced Land Remote Sensing System called for by the Land Remote Sensing Policy Act, and questions from the audience.

So, after successfully hosting Pecora 12 as well as two additional Forums at the Holiday Inn City Centre, EDC staff are to be congratulated on another job well done, "It was a pleasure for me to be able to chair a group like this," reflected Haas. "I hope that the Pecora series (of symposia) will continue. Everything just fell into place very well and we were very pleased with the participation of EDC employees." According to Haas, the proceedings from Pecora 12 will be published as soon as possible with a target date of December 1993. ☛

### *Landsat National Security continued from page 2*

addressed at the programmatic level. Beyond that Herring says the conference provided her a great opportunity to get to know DoD activities and users. "Not having much of a background in the DoD process, I was surprised by the number of different organizations within the DoD that are doing similar types of activi-

ties. So, the functionality of the Central Imagery Office (CIO) that's just been formed is significant because it seems like it will be quite a challenge to centralize all those activities within DoD. We're interested in working with the CIO to make sure that the system that NASA's building is also consistent with the architecture and standards that they're recommending for the DoD community to minimize impact across DoD users."

### DoD

Because Landsat data go to the heart of many DoD missions, a DoD user voicing strong input during the conference was **D. Brian**

**Gordon**, Chairman of the DoD Multispectral Users' Group, Defense Intelligence Agency, Clarendon, VA.



**D. Brian  
Gordon**

According to Gordon there are two major issues that concern everyone with the DoD who attended the conference: cost of the data and customer service. "We believe that the level of customer service and the ground processing throughput for the High Resolution Multispectral Stereo Imager (HRMSI) data are monumentally low as compared to the collection capabilities of the space segment.

However, we in the DoD think we have our game together quite tightly at this point. DoD probably has a remarkable advantage over the civil sector because, despite all of our supposed shortcomings, the requirements and needs process within DoD is a very good process. Therefore, we understand our requirements and needs probably to a degree much, much better than outsiders would expect. So, when we come to these conferences, we probably are a little bit more critical of the answers when it comes to customer needs and customer satisfaction."

Gordon also stressed that the most critical issue related to Landsat customer services involves adequate planning. "If Landsat 7 comes online

at the very beginning of 1998, that pegs 1997 for training and installation of whatever exploitation, production/reproduction equipment is necessary. That leaves 1996 for installation and contracting work and whatever minimal development work is necessary. That then gets us into 1995 for the procurement and necessary contracting work - all which says we have 1 year for planning on this."

In broad generalities, the DoD and civil sectors have similar Landsat needs. However, there are major differences in the nature of these two sectors. The civil community is diverse, disconnected, independent, and multifaceted. Therefore, it's much more difficult to come up with a realistic customer survey.

### Private Sector

While the Landsat 7 Users' Conference was organized primarily for the benefit of DoD users, other government and private organizations were represented.

Representing the Geodynamics Corporation, Alexandria, VA was **Andre Kiebusinski**, who is responsible for supporting the design and requirements effort for Landsat 7. "I'm here primarily to see who the players are and to see what their needs are," explains Kiebusinski. "I've always been on the civil side, so now that I'm working for the DoD side, it's very beneficial for me to see what the DoD's needs and requirements are. I'm learning a lot."



**Andre Kiebusinski**

From the mid-1980s until recently, the future of the Landsat program was questionable at best. Because EROS was able to host a conference for organizations that use Landsat data, it demonstrates the program's dramatic reversal in fortune. In addition, this conference once again provided the Data Center with a vehicle to showcase its expertise and facilities to the DoD community and others, while simultaneously



**John Faundeen**, Information Systems Management Leader, and **Pat Johnson**, Customer Services, show **Terry S. Kees**, Director, Plans, Policy, and Program Directorate, Central Imagery Office, a demo featuring the Global Land Information System.

address questions involving planning, data cost, and customer service issues.

"We had several sites in mind when we first came to the realization that we really wanted to do this (hold a Landsat conference)," explained Gourley. "We contacted all those different places, and EDC was one of them, to see what kinds of provisions could be made. One of the prime reasons we came to the EDC was the enthusiasm to sponsor this (conference) and help us make this thing a success. We've really appreciated the support we've gotten from EDC. It's been great." ☺

## Employee News

### U.S. Geological Survey

#### STUDENTS:

**Chris Cushenbery** - Chris was hired June 20th as a computer clerk intern by the Computer Services Branch. Originally from Colorado Springs, CO, Chris currently attends Dakota State University where he is majoring in Computer Science. He enjoys golf, sports, and card collecting in his spare time.

**Dallas Bridges** - Dallas became a member of the Computer Services

Branch July 26th. Originally from Spearfish, SD, Dallas currently lives in Brookings, SD where he is working on a M.S. in Electrical Engineering at SDSU. In addition to testing and documenting software at EDC, Dallas' hobbies include golf, computers, and sports.

**Caroline Johnson** - Caroline joined the Computer Services Branch as a computer clerk July 26th.

**David Hopkins** - David was hired as a Computer Clerk by the Computer Services Branch August 23rd. Originally from Orlando, FL, David now lives in Sioux Falls. In his spare time, David enjoys the martial arts.

#### PROMOTIONS:

**Tom Loveland**, Remote Sensing Scientist, Science and Applications Branch, and **Mark Shasby**, Chief, EROS Alaska Field Office, received "quality step increases" for their outstanding performance during the past year.

Science and Application Branch student co-op program participants **Mark Hillesheim** and **Kevin Larson** have received promotions based on academics and experience.

**James Verdin** - Jim recently earned a promotion for his work involving international projects.

#### AWARDS:

**Jean Happel** - Jean has been recognized for her work coordinating the Federal Womens' Program.

The following USGS employees received "On the Spot Awards" for their contributions in making the Landsat 7 Users' Conference a success: **Kris Constant**, **Mary Lou East**, **Ron Beck**, and **Carol Van Winkle**.

The following employees have received performance awards:

Program Development & Control Office: **Genny Austin**, **Carolyn Hieb**, **Donald Zoller**

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## "Clackamus Crew" Shares Data to Monitor Land Characteristics

The EROS Data Center hosted members of a unique interagency partnership June 24-25 to continue discussions on a project known as the Multi-Resolution Land Characteristics Monitoring System (MRLCMS). The MRLCMS is a system being developed to provide broad-based research on existing and future conditions of physical and biological resources within the United States.

The MRLCMS concept stems from the cooperative effort of six Federal programs with similar remote sensing and research needs:

- U.S. Geological Survey Land Characterization Program and the National Water-Quality Assessment (NAWQA)
- U.S. Environmental Protection Agency Environmental Monitoring and Assessment Program (EMAP) North American Landscape Characterization (NALC)
- National Oceanic and Atmospheric Administration Coastwatch-Change Analysis Program (C-CAP)
- U.S. Fish and Wildlife Service Gap Analysis Program (GAP).

**Tom Loveland**, Science and Applications Branch, **Jim Sturdevant**, Acting Chief, Program, Budget and Administration Office, and **Tom Holm**, Deputy Chief, Data Services Branch, coordinated and hosted the discussions on behalf of the Data Center. According to Holm, the visit was the third meeting to coordinate a single purchase of Landsat Thematic Mapper data of the lower 48 states, and discuss potential centralization of pre-processing and processing activities associated with the project. "**Denice Shaw**, who represents the EPA's EMAP program, recognized that her program needed wall-to-wall Landsat TM data of the lower 48 states. She also knew that the U.S. Fish and Wildlife Service's Gap Program, the USGS Water

Resource Division's NAWQA program, and the NOAA's C-CAP required similar TM data of the United States. Therefore, she thought that if all these groups would go out and buy their TM data separately, dealing with EOSAT on an agency-to-EOSAT basis, they most likely would buy the same scenes three or four times."

As a result, Shaw got these programs together in Clackamus, OR in April to begin discussing and working towards pooling their resources and buying the TM data once - with a negotiated deal with EOSAT that would allow this multi-agency partnership to use the data collectively with a single buy. "That was the role that we knew they were looking to us (EDC) to play," says Holm. "We've had a brokerage agreement with EOSAT since 1986 that has funneled over \$25-million dollars worth of Landsat purchases for about 30 different agencies. It's a proven system of data procurement allowing simple government-to-government agency transfer of funds."

So, the "Clackamus Group" met in Las Vegas in May and at the EDC in June to begin identifying 430-plus scenes covering the entire lower 48 states. **Paul Severson**, Customer Services, was assigned to help select and preview data for the group. In addition to agreeing on what data to buy from EOSAT, the group also had to address pre-processing/processing issues. Holm says this is where Tom Loveland's AVHRR Land Characterization data base of the conterminous U.S. provided an excellent model. "The concept involves establishing a multi-scale central data base of periodic remotely sensed data, elevation, soils, cartographic and other landscape information, with linkages to relevant data at other locations, all flexibly designed to provide a wide variety of derivative products in a variety of formats; users would model or tailor products themselves. As a

result, we put together a rough outline of a concept called the Development and Application of a MRLCMS with three objectives:

1. Continue AVHRR 1-kilometer land characterization work for the entire globe,
2. Participate in cooperative land characterization work with EMAP, NALC, GAP, NAWQA, and C-CAP using TM data for the lower 48 states, and
3. Develop a monitoring system."

This highly visible interagency project is providing 15 additional jobs to the Center. "Even though we must deliver products in 1994 and '95," explains Holm, "the project will go well into fiscal years 1996 and '97."

In addition to Loveland, Sturdevant, and Holm, participants in the 2-day visit included: **Gail Thelin**, National Water Quality Assessment (NAWQA) Program, Water Resources Division, USGS, Sacramento, CA; **Denice Shaw**, Environmental Monitoring and Assessment Program (EMAP), Environmental Protection Agency, Research Triangle Park, NC; **L. Dorsey Worthy**, North American Landscape Characterization (NALC) Program and EMAP, EPA, Las Vegas, NV; **Donald Field**, Coastwatch-Change Analysis Program (C-CAP), National Oceanic and Atmospheric Administration, Beaufort, NC; **Chuck Dull**, Remote Sensing Coordinator, U.S. Forest Service, Washington, D.C.; and **Michael Jennings**, GAP Analysis Program, Fish and Wildlife Service, Moscow, Idaho.

According to Jennings, the federal agencies collaborating on this project recognized that if they cooperated with each other, all projects involving the federal agencies represented at the discussions would benefit in terms of products produced, establishing standard methods, and budget.

"Procuring Landsat data is the most expensive part of our programs and although the Landscape Characterization hadn't really, in

earnest, started purchasing large amounts of Landsat, they could certainly see that it constituted an enormous part of their budget."

While the seven people comprising the Land Characteristics Monitoring System group goes by no specific name, or acronym...yet...they have



**Michael Jennings**

been calling themselves the "Clackamus Group" because their initial meeting was held in Clackamus, OR (outside Portland). Whatever the name, the group is setting a

trend in scientific interagency cooperation. "All of us came together because of there being a common good," says Jennings. "We realize that while our different programs have common needs, there was a point at which we would diverge to achieve our different missions."

The real significance of what the "Clackamus Group" is trying to achieve is trailblazing a new trend in governmental research called "administrative enterprise." "This kind of effort really does represent that synergism that goes beyond budgets," explains Jennings. "I think the significance is much, much deeper than just budgets. It relates to an entire societal shift in the way that we're doing business - a much more open and free-flowing way of doing business. It's leveraging a lot more efficiency all the way around. There's no question that we are breaking down agency barriers and

discipline barriers in almost a startling way. It is a very, very exciting thing to be involved in."

In addition to Jennings, many other segments of the scientific community are recognizing the unique work and capabilities of the Data Center. An example is the work that Loveland has done in land characterization - the type of work that is at the forefront of technology and research. According to Holm, "We have an excellent opportunity to participate in an unprecedented interagency partnership because of our ability to collect and manage data, and develop applications for environmental managing and monitoring with the existing EDC infrastructure."

The multi-agency work associated with the MRLCMS essentially is getting the EDC back to its "roots" - cooperative projects involving other natural resource management agencies. One of the key partners in this effort is the Gap program. The Gap program will comprise the largest project activity making its way to the new National Biological Survey (NBS) [a new agency within the Department of the Interior initiated by Interior Secretary Bruce Babbitt]. As a result of the EDC's involvement with the MRLCMS, a very tight relationship will be formed between the USGS and the NBS - a good omen for future EDC cooperative project activities. ♣

himself the piano. While Westin didn't inherit his father's musical talent, he did acquire his appreciation for woodworking and fine music. "I read the book," says Westin, "and thought it would be something I'd be interested in doing. I got several other publications including an article from *Scientific American* about the physics of violins and the relationship of the upper plate (made of spruce) and the back plate (made of maple) and how they amplify the sound produced by the strings.

According to Westin, it takes one-to-two years to make a violin. The process goes something like this. "First you make a mold or form, and for violins this can be either an interior or exterior mold. The mold is really a support round or into which the ribs and blocks are built. After bending the ribs, they are glued to the blocks and the whole assembly set aside until the top and back plates are cut and shaped.

The back is glued to the sides first. Since the ribs are only one-sixteenth of an inch thick, strips of basswood, called linings, are glued to the sides where they join the upper and lower plates, to provide more gluing surface. The next assembly step is to glue the top and finally the neck and pegbox, with the fingerboard attached, to the instrument. Before the top is glued on, you glue in a basebar, a strip of spruce, located under the left foot of the bridge. When the instrument is played, the basebar distributes the vibrations over the entire top.

Water-soluble hide glue is used throughout the construction of the instrument. This type of adhesive allows parts to be steamed apart if repairs are needed. After the instrument is assembled, you add a soundpost - a small, dowel-shaped piece of spruce located under and slightly behind the eventual location of the right foot of the bridge. The sound

*Dr. Fred Westin is a retired South Dakota State University professor of Soil Science who serves as a consultant with the Data Center's International Projects section. When he tires of interpreting soils maps and making agricultural assessments of Africa, Westin makes violins.*

## Woodworking Music into a Hobby

**F**red Westin's violin-making hobby began in 1963 following the death of his mother. While cleaning out her house in northeast Wisconsin, he found some pieces of maple and spruce wood and a book

on violin-making his father had set aside before his death in 1932.

Westin's father was a talented, self-taught musician who played stringed and brass instruments, and taught

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### *Westin Woodworking continued from page 9*

post is held in place by friction rather than glue. The sound post distributes the vibrations of the strings to the back of the instrument to accentuate the sounds.

The fingerboard, pegs, saddle, tail-button and nut are made of ebony and purchased from a supply house. Purfling, which is a narrow strip of 3-ply wood (a white strip between two black strips) also is purchased from a supply house.

The saddle is a small rectangular piece fitted into the bottom edge of the top plate above the tailbutton for the tail-piece gut to ride over. The nut also is a small rectangular piece glued to the fingerboard for the strings to ride on just before they enter the pegbox. The purfling strips are glued into a narrow channel cut around the edges of the top and bottom plates."

Once the instrument is fully assembled but before the strings are added, Westin applies a product called "Grain Tamer" to the top plate to guard against a blotchy finish, which often occurs when using soft woods. "I don't use it (Grain Tamer) on the back, sides or pegbox because I want the flame of the maple to stand out there," explained Westin.

After using "Grain Tamer", Westin applies a water-soluble stain of yellow or amber to the wood parts of the instrument before applying six-to-eight coats of a special varnish called "Instrument Makers Varnish."

If you're not a skilled carpenter, the entire process sounds painstakingly perplexing. According to Westin, there are only a couple of intricate steps involved in the violin-making

process. "Cutting the purfling channel is one. The second (intricate step) is getting the top and back the proper thickness. The thickest part of the wood is in the center and then it tapers gradually to the edges."

Since 1963 Westin has made 35 stringed instruments, usually taking 1-to-2 years to complete. While his collection is comprised mostly of violins, he has also made six violas and one cello.

Westin's toughest project thus far has been the cello. "The pieces of wood are so big that just making the

"I also discovered that the wood that my father had saved had been cut the wrong way for instrument making. Both the upper and lower plates, as well as the sides, neck, and scroll, are made from quarter-sawn wood. You can visualize what that is when you think of a log cut in segments (about 15 inches long for a violin) and split into pie-shaped pieces. Quarter-sawn wood brings out the flame grain of the maple and also strengthens the maple and spruce used for the top plate.

Westin combines his appreciation of classical music with his love of woodworking. He uses power tools to cut the rough shape of his instruments, although he relies on hand-tools such as small planes and chisels to perform the delicate precision work. "It is important to remember that if things aren't going right, you have to quit, do something else, and then come back to it.

In addition to bowed instruments, Westin also has made a guitar and a dulcimer. He also has worked on projects other than stringed musical instruments. For example, he has

built cabinets, chests-of-drawers, and his Brookings home, with the help of his wife, Wilma.

Because Westin makes violins to relax, he has never sold any of his instruments. While he has given a dozen of his instruments to his four daughters, he has kept the rest. According to Westin, his hobby is purely for pleasure. "If you're under the gun to produce something for somebody, it wouldn't be fun anymore. The hours I spend crafting stringed instruments are quality hours." Westin smiles before adding, "You don't charge people for that." ☺



**Fred Westin** crafts one of his hand-made violins in his Brookings wood-working shop.

form is a carpenter's job all in itself," says Westin with a grin. "After you get the proper dimensions, you have to bend the wood for the sides. This required making a new bending iron. The first attempt I made at gouging out the interior of the back plate I was using a power tool instead of a hand chisel. I went right through the side of it," chuckles Westin. "A \$100 piece of wood was ruined. I've kept that piece of wood as a reminder of what happens when you get in too big of a hurry."

According to Westin, his first attempts at making instruments didn't look or sound very good. However, he discovered the patience he needed to improve his technique.

## Vanpool Vanquishes Transportation Costs

The EROS Vanpooling Association was established 14 years ago at the peak of the energy crunch. You may remember the oil crisis of the late 1970s: long lines at the gas pump accompanied by skyrocketing fuel prices. In response to rising fuel costs and the possible threat of a gas rationing system, EROS employees banded together to provide a less expensive alternative form of daily transportation to-and-from the Center.

The EROS Vanpool Association incorporated itself as a non-profit, employee-controlled, non-government entity to provide optimum flexibility and involve all EROS employees (regardless of employer). As a result, the Vanpool was able to operate across city, state, and federal offices - free to accept assistance from Technicolor Graphic Services (\$5,000), the Southeastern Council of Governments (\$5,000) as well as future assistance from the South Dakota Department of Transportation.

The first EROS van, carrying 15 employees, hit the streets of Sioux Falls and the roads of Minnehaha County in November of 1979. By the end of the next month, three additional vans [totting a total of 60 employees]

were added to the vanpool. Since then the employee owned-and-operated EROS Vanpool has been in cruise control.

If we reflect on the success and savings of the EROS Vanpool over the past 14 years, we see some pretty impressive statistics. For example, during its peak ridership, 1983-1986, the Vanpool provided service for 115 employees in Sioux Falls, Dell Rapids, Sherman, Trent, Renner, Brandon, and Valley Springs. Perhaps even more impressive are the miles EDC Vanpool riders have ridden. As of this date, over 850,000 cumulative miles have been traveled - translating into roughly 34 million passenger miles!

While the number of riders has fallen from its peak of over 100, the Vanpool remains at the hub of the EDC's daily operation. Currently 68 employees comprise a membership, featuring a four-van fleet that services the Sioux Falls metro area. Each member travels approximately 50 miles each day at 4.5 cents per mile (\$45/month).

The EROS Vanpooling Association conservatively estimates that it has saved over 300,000 gallons of gas in the past 14 years. Therefore, if you

detest winter driving, or dream of sleeping on your way to work, the EROS Vanpool is your dependable alternative transportation choice. In addition to saving money on gas, maintenance, and insurance, you'll be conserving energy, eliminating stress, and making it easier on the environment.

So before the wind chill hits 40 below, consider joining the EROS Vanpool. All you have to do is give Tim Smith a call at ext. 6091 - and let the EDC Vanpool do your driving and scraping this winter. Act now while space is available! ☺

## Land of Genghis Khan Receives AVHRR Imagery

by Don Zoller

The year was 1242 when Genghis Khan, the great unifier of the Mongolian Empire, with his powerful army overran Hungary and Poland, and was set to overwhelm Germany. Since that time the Mongolian Empire has been reduced in power and influenced to what is known today as the Republic of Mongolia. During its domination by the Russian communists it supported a \$1 billion economy. With the departure of the Soviets and their technology in 1990, the economy struggles to maintain itself at \$500 million. Today, in a land where nothing seems to work, because there are no parts to repair what is broken, none of the elevators in Ulaan Baatar, Mongolia's capital city, work.

Two years ago a group of Christian business men and women from various churches in the Sioux Falls area met to develop a plan of action to address the socioeconomic needs of the emerging democratic Republic of Mongolia. Today, about 20 local business people make up the Among



**Betty Stillson** and **Norman Bliss** are the first riders off one of four vans comprising the EDC Van Pool.

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## Land of Genghis Khan Continued from page 11

(American/Mongolian) International project, lead by **Craig Lawrence** of Lawrence and Schiller advertising agency. They meet weekly to discuss Among's various projects in Mongolia, including agricultural development, communications, tourism, medical assistance, constitutional law, and sponsoring Mongolia's one and only basketball team, which included providing a full complement of shoes and uniforms. Among is the only resourcing organization in the United States committed to the rebuilding of the infrastructure and lives of the Mongolian peoples.

At the invitation of government officials in Mongolia, Among has sent several delegations to work with the Mongolian peoples in a wide range of activities. In January 1992, 23 business people from Sioux Falls went to Mongolia to offer assistance. Recently, one delegation brought with them 600 pounds of vegetable seed, since the people of Mongolia had none. A subsequent delegation demonstrated soil testing technology, and provided agro-consulting and other expertise in farming.

On a recent trip to Mongolia, Craig Lawrence met with **Tsakhagiin Elbegdorj**, Chairman of the Mongolian Parliament, and presented him with an AVHRR image of the

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conterminous United States as an expression of friendship between the two countries. The image will be framed and hung in the Government House of Mongolia, which is equivalent to the U.S. Capitol Building.

**Choinarian Choinkhor**, the son of the Secretary of State of Mongolia, recently said that the Christian faith is important in the country's transition from communism to a free-market society. Among, he said, helps my people solve their own problems, which is the best form of help. It is also an opportunity to show the people of Mongolia that hope exists.

At EDC, **Don Zoller** and **Harold Christiansen** are associated with the Among project. ☘



**Craig Lawrence**, Lawrence & Schiller, Inc. advertising agency in Sioux Falls, presents a mosaic AVHRR image of the conterminous United States to **Tsakhagiin Elbegdorj**, Chairman of the Mongolian Parliament.

## Employee News Continued from page 7

Data Services Branch: **Jane Strand, Rita Tornow**

Science & Applications Branch: **Susan Jensen**

Tech. & Admin. Services Office: **Arls Johnson, Ron Beck**

The following employees have received special achievement awards:

EOS Data Systems Project Office: **John Boyd, Lyn Oleson, Bruce Quirk**

### Hughes STX

**Sharon Harrison** - Sharon is a new part-time employee with the International Projects section. Hired Aug. 16th, Sharon will support Famine Early Warning System (FEWS) activities.

**Morgan Sarges** - Morgan joined Archive Management July 23rd to support the conversion of Side Looking Airborne Radar (SLAR) data to CDs.

**Yihui Zhan** - Yihui has been working with the International Projects section since June 21st. A student at the University of Washington-Seattle, Yihui currently is living in Dell Rapids with his wife.

**Kristine Verdin** - Kristine is working with the Land Sciences group within the Science and Applications Branch. Hired June 16th, Kristine is working with **Don Ohlen & Co.** on land characterization activities. If the name Verdin looks familiar, it is - her husband Jim serves as Don Moore's deputy in the International Program.

**Aslam Maxon** - Aslam came on board Aug. 23rd as a programmer with Randy Sunne's shop.

### VESCO

**Mary Johnson** - Mary was hired as an electrician in July. She is providing VESCO with additional electrical support services. ☘